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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,241	10/05/2005	Satoshi Sugahara	HIRA.0178	1606
38327	7590	12/04/2007		
REED SMITH LLP 3110 FAIRVIEW PARK DRIVE, SUITE 1400 FALLS CHURCH, VA 22042			EXAMINER VALENTINE, JAMI M	
			ART UNIT 2815	PAPER NUMBER
			MAIL DATE 12/04/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/522,241

Applicant(s)

SUGAHARA ET AL.

Examiner

Jami M. Valentine, Ph.D.

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 71-82 and 141-150 is/are pending in the application.
- 4a) Of the above claim(s) 83-140 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 71-82 and 141-150 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of the Application***

1. Acknowledgement is made of the amendment received 8/31/07. **Claims 1-20** are pending in this application. **Claims 83-140** were previously withdrawn as being drawn to nonelected inventions. The requirement is deemed proper and is therefore made FINAL. Claims 71-73 and 82 were amended and claims 141-150 were newly presented in the amendment received 8/31/07. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Drawings***

2. The objection to the drawings has been withdrawn in light of the amendment received 8/31/07.

### ***Specification***

3. The amendment filed 8/31/07 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "the spin analyzer including an corrector". The specification makes no mention of a corrector.

4. Applicant is required to cancel the new matter in the reply to this Office Action.

### ***Claim Objections***

5. Applicant is advised that should claims 142 be found allowable, claim 143 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing,

despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 71-80** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. “the spin analyzer including an corrector”. The specification makes no mention of a corrector. The examiner believes that Applicant intended to recite “a collector”.

8. The previous rejections under 35 U.S.C. 112, second paragraph have been withdrawn in light of the amendment received 8/31/07.

9. **Claims 71-82 and 141-150** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claims 71 and 81 recite a “corrector.” It is unclear what is intended by this limitation. It is impossible to determine if this is actual structure, or simply the function of the spin analyzer. The specification makes no mention of a corrector. The examiner believes that Applicant intended to recite a collector, since the disclosed invention includes a transistor with an emitter and no corresponding collector. The use of the term collector is supported by Applicant’s

disclosure (e.g. specification paragraph [0052]) For the purposes of examination in view of the existing prior art, the term corrector will be interpreted to mean a collector.

11. Per Claims 72 and 141, the following language is indefinite "...the first nonmagnetic electrode layer being the emitter..." It is unclear whether the layer is an electrode, an emitter or both. The following language is indefinite "the second nonmagnetic electrode layer being the base." It is unclear whether the layer is an electrode, a base or both. This claim is deficient because it is imprecise. Hence, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention and this claim is rendered indefinite.

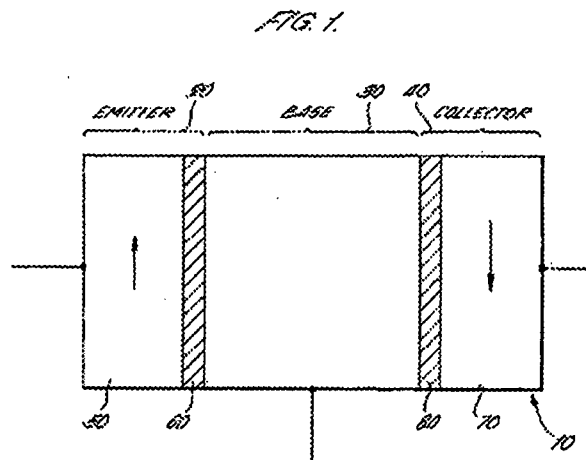
12. Per Claims 73 and 143, the following language is indefinite "...the third nonmagnetic electrode layer being the collector..." It is unclear whether the layer is an electrode, an collector or both. This claim is deficient because it is imprecise. Hence, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention and this claim is rendered indefinite.

### *Claim Rejections - 35 USC § 102*

13. **Claims 71-81** are rejected under 35 U.S.C. 102(b) as being anticipated by Gregg et al. (International Patent Application Publication No WO 01/69655) hereinafter referred to as Gregg.

14. Per **Claims 71 and 81** Gregg (e.g. figure 1) discloses a device, comprising

- a spin injector (50) for injecting spin-polarized hot carriers by a spin-filter effect, the spin injector including an emitter (20);
- a spin analyzer (70) for selecting the thus injected spin-polarized hot carriers passing through a base (30) by the spin-filter effect, the spin analyzer including an collector (40).



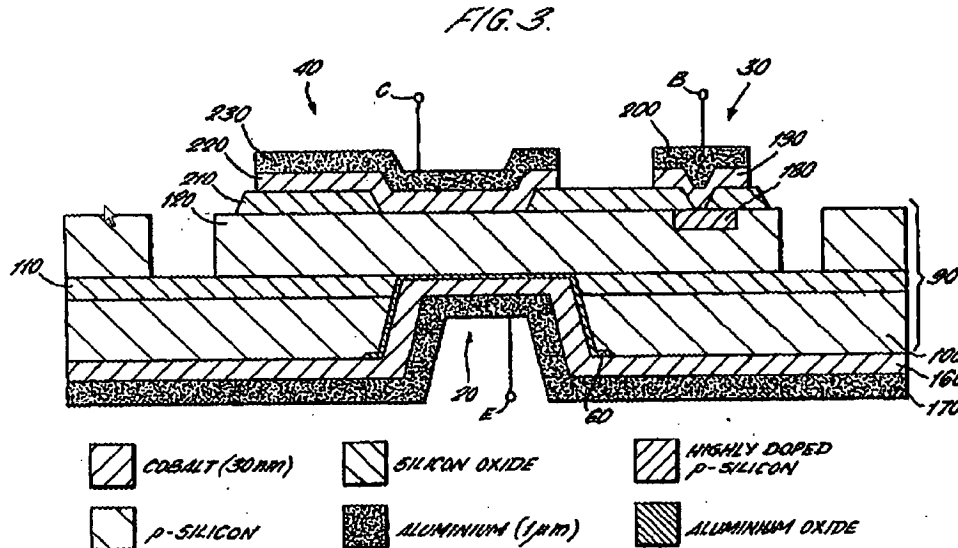
*Prior Art: Gregg Figure 1*

15. Additionally, claim 71 recites the performance properties of the spin injector and the spin analyzer. This functional limitation does not distinguish the claimed device over the prior art, since it appears that this limitation can be performed by the prior art structure of Gregg. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) See MPEP 2114.

16. Per **Claims 72 and 141** Gregg (e.g. figure 3) discloses the device of claims 71 and 81, respectively including where the spin injector (20) comprises

- a first ferromagnetic barrier layer (160) through which the carriers can be transported by tunneling upon application of a voltage across said first ferromagnetic barrier layer;
- a first nonmagnetic electrode layer (170) joined to one end surface of said first ferromagnetic barrier layer the first nonmagnetic electrode layer being the emitter;
- a second nonmagnetic electrode layer (120) joined to the other end surface of said

first ferromagnetic barrier layer, the second nonmagnetic electrode layer being the base. (see page 12, line 19 through page 13, line 11)



Prior Art: Gregg Figure 1

17. Additionally, claims 72 and 141 recite the performance properties of the first and second nonmagnetic electrode layers. This functional limitation does not distinguish the claimed device over the prior art, since it appears that this limitation can be performed by the prior art structure of Gregg. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) See MPEP 2114.

18. Per **Claims 73, 142 and 143** Gregg (e.g. figure 3) discloses the device of claims 72 and 141, including where the spin analyzer (40) comprises

- a second ferromagnetic barrier layer; (220)
- said second nonmagnetic electrode layer (120) joined to one end surface of said

second ferromagnetic barrier layer; and

- a third nonmagnetic electrode layer (230) joined to the other end surface of said second ferromagnetic barrier layer, the third nonmagnetic electrode layer being the collector;
- wherein said second nonmagnetic electrode layer (120) is common to said spin injector and said spin analyzer so as to form the base. (e.g. figure 3)

19. Per **Claims 74 and 144** Gregg discloses the device of claims 73 and 142, respectively including where said first and second ferromagnetic barrier layers comprise a ferromagnetic semiconductor or a ferromagnetic insulator [0018].

20. Per **Claims 75 and 145** Gregg discloses the device of claim 72 and 144, respectively including where the thickness of said second nonmagnetic electrode layer is smaller than the mean free path of the spin-polarized hot carriers in said second nonmagnetic electrode layer. [0043]

21. Per **Claims 76 through 80** Gregg discloses the device of claim 72. These claims recite the performance properties of the device. These functional limitations do not distinguish the claimed device over the prior art, since it appears that this limitation can be performed by the prior art structure of Gregg. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-32 (Fed. Cir. 1997) See MPEP 2114.

22. Per **Claims 146 through 150** Gregg discloses the device of claim 141. These claims recite the performance properties of the device. These functional limitations do not distinguish



the claimed device over the prior art, since it appears that this limitation can be performed by the prior art structure of Gregg. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) See MPEP 2114.

***Claim Rejections - 35 USC § 103***

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

25. **Claim 82** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gregg in view of Noguchi et al. (US Patent Application Publication No 2003/0013843) hereinafter referred to as Noguchi.

26. Per **Claim 82** Gregg discloses the device of claim 81 but fails to teach where said second nonmagnetic electrode layer (120) is connected to a wordline, said third nonmagnetic electrode layer (230) is connected to a bitline, said bitline is connected to a power supply via a load, and said first nonmagnetic electrode layer of said transistor is connected to ground.

27. Noguchi teaches a device including a transistor with a second nonmagnetic electrode layer (205) is connected to a wordline (202), a third nonmagnetic electrode layer (207) is connected to a bitline (114), and the bitline is connected to a power supply via a load, and the first nonmagnetic electrode layer of said transistor is connected to ground (column 25 lines 41-59).

28. All of the component parts are known in Gregg and Noguchi. The only difference is the combination of the old elements into a single device, by using the transistor device of Gregg in the circuitry (i.e. bit line, word line and connections) of Noguchi. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Noguchi and Gregg in order to achieve the predictable result of enabling the operation of a transistor by putting into a circuit. Additionally, it would have been obvious to a person of ordinary skill in the art to try circuitry of Noguchi in an attempt to provide an improved device, as a person with ordinary skill has good reason to pursue the known options within his or her technical grasp. *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007).

***Cited Prior Art***

29. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US Patent No 5,416,353 by Kamiguchi et al.

*Conclusion*

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jami M. Valentine, Ph.D. whose telephone number is (571) 272-9786. The examiner can normally be reached on Mon-Thurs 8:30am-7pm EST. **NOTE:** From June 18 through August 8<sup>th</sup>, The examiner will be available *only* on Thursdays and Fridays 8:30am-7pm EDT, due to jury duty service.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

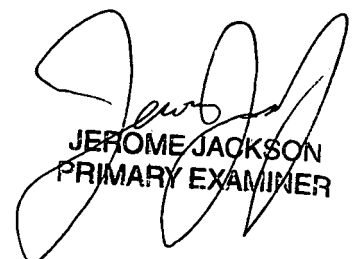
Application/Control Number:  
10/522,241  
Art Unit: 2815

Page 11

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Jami M Valentine, Ph.D.  
Examiner  
Art Unit 2815

JMV

  
JEROME JACKSON  
PRIMARY EXAMINER